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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/374,502	08/13/1999	QING MA	42390.P6623	3832

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EXAMINER

FENTY, JESSE A

ART UNIT PAPER NUMBER

2815

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/374,502

Applicant(s)

MA ET AL.

Examiner

Jesse A. Fenty

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 34-40 is/are allowed.
- 6) ☒ Claim(s) 32, 33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (U.S. Patent No. 6,455,912 B1) in view of Puchner et al. (U.S. Patent No. 6,144,076).

In re claim 32, Kim (Fig. 4) discloses a semiconductor device, comprising:

An active area formed in a semiconductor substrate; and

An isolation structure comprising at least one dielectric material (108) disposed within a trench which extends into said semiconductor substrate, wherein said isolation structure substantially surrounds said active area, wherein at least a portion of said isolation structure is adapted to modify stresses incurred on said active area (Summary of the Invention, lines 39-56), and wherein said isolation structure comprises a tensile stress-inducing dielectric material (column 4, lines 40-41) disposed within said at least a portion of said trench.

Kim discloses the STI regions surrounding an active area (column 1, lines 29-33), but does not expressly disclose the active area comprising nMOS transistors. Puchner discloses STI regions (10) surrounding nMOS and pMOS transistors. It would have been obvious for one skilled in the art at the time of the invention to use nMOS and pMOS transistors as disclosed by

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Puchner for the active area of Kim for the purpose, for example, of enhancing the versatility of the active region.

In re claim 33, Kim in view of Puchner discloses the device of claim 32, wherein said active area includes a width and wherein said isolation structure comprises at least a portion of said trench having a depth such that an aspect ratio of said trench portion depth to said active area width is greater than about 0.5. The ratio is interpreted to mean that the depth of the trench over the width of the active area is greater than about 0.5; meaning that the width of the active area is about twice the depth of the trench. Puchner discloses (column 2, lines 60-67; column 3, lines 1-8) a trench depth that may be varied. When the trench is at a shallow depth, the aspect ratio will be within the claimed range.

Allowable Subject Matter

1. Claims 34-40 are allowed.

Response to Arguments

2. Applicant's arguments filed 05/04/04 have been fully considered but they are not persuasive. Examiner mistakenly included a reference to both 35 U.S.C. 102 and 103 in the previous action. However, the body of the rejection clearly showed that the examiner was making a 35 U.S.C. 103 rejection. Applicant's arguments regarding that rejection are considered here.

- a. Applicant argues that neither the Puchner patent nor the Kim patent, either alone or in combination, teach or suggest both an n-type source region and an n-type drain

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region. On the contrary, Puchner very clearly shows an example of an active region comprising an n-type source region (54) and an n-type drain region (56).

b. Applicant argues that Puchner does not discuss the width of the active area. In the previous rejection, examiner explained that the “aspect ratio” of said trench portion depth to said active area width equaling 0.5 was interpreted to mean that the trench depth is about half the distance of the active area width. Looking at the drawings provided by Puchner, this ratio seems to fit. The active area width, from source (54) to drain (56) appears to be about twice the distance measured from the top of the substrate to the bottom of the trench (10).

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

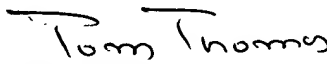
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse A. Fenty whose telephone number is 703-308-8137. The examiner can normally be reached on 5/4-9 1st Fri. Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Jesse A. Fenty
Examiner
Art Unit 2815


TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800